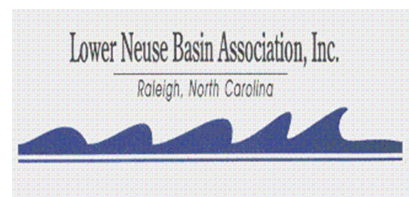


**Memorandum of Agreement
Between
The State of North Carolina's Division of Water Resources
and
The Lower Neuse Basin Association (LNBA) Permittees**



**Effective:
August 1, 2014 through July 31, 2019**

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MEMORANDUM OF AGREEMENT

This Memorandum of Agreement (MOA) is made by and between the NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCE'S DIVISION OF WATER RESOURCES (DWR), the NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGERS in the Lower Neuse River Basin who have voluntarily executed this MOA (the LNBA PERMITTEES) and the LOWER NEUSE BASIN ASSOCIATION (the LNBA), a non-profit corporation whose members include the LNBA PERMITTEES. The MOA includes attached tables and appendices. This MOA does not affect any influent or effluent monitoring requirement or any other NPDES permit requirements of individual permit holders with the one exception of performing upstream and downstream water quality monitoring. The LNBA PERMITTEES are exempted from instream monitoring as specified in their individual NPDES permits beginning on the effective date of this MOA and continuing for the duration of each permittee's participation in this MOA. Subsequent to the execution of this MOA, the DWR will issue a letter to each LNBA PERMITTEE notifying the permittee that the instream monitoring requirements of its permit are not effective for as long as this MOA is in place and the permittee remains a party to this MOA.

The purpose of this MOA is to establish a formal agreement between the DWR, the LNBA PERMITTEES and the LNBA. This MOA authorizes the LNBA to act on behalf of the LNBA PERMITTEES as described herein. This MOA identifies the responsibilities of the LNBA PERMITTEES and the LNBA for surface water monitoring and reporting within the Lower Neuse River Basin. The water quality monitoring will occur at strategically located surface water sites to obtain information on water quality in the basin. Monitoring sites and parameters, listed in Appendix A, were established by the DWR such that the instream monitoring is efficient, effective, and basin-oriented.

The LNBA will perform the monitoring activities described herein on behalf of LNBA PERMITTEES who are members in good standing of the LNBA. Each LNBA PERMITTEE agrees to remain a member in good standing of the LNBA. The LNBA will contract for the performance of the monitoring activities described herein and in Appendix B, with a laboratory appropriately certified by the DWR for the required laboratory and field analyses. Sample collection and field measurements will be made by the LNBA PERMITTEES, the LNBA, or a sub-contractor who will act as agent(s) of the LNBA PERMITTEES for the sole purpose of performing monitoring services required by this MOA. It will be the responsibility of the LNBA to coordinate the collection and analyses of the water quality monitoring data for the locations, parameters, and frequencies specified in Appendix A of this MOA. Sample collection, field measurement, and target reporting limits are specified in Appendix B of this MOA. Monthly and annual reporting requirements, including data format and data summaries are described in Appendix C of this MOA.

The LNBA shall submit the water quality data electronically to the DWR using the format documented in Appendix C of this MOA, in Microsoft[®] Excel 2003, a subsequent version, or the equivalent. The LNBA shall submit the water quality data to the DWR within 90 days of the end of the month in which the sampling was performed. All data shall be archived by the LNBA for a period of 5 years. Each LNBA PERMITTEE has the right to review and comment on work, data, or reports prepared by any contractor on behalf of the LNBA PERMITTEES and to notify the DWR of any objection or disagreement with any portion of the work, data or reports. Unless such notice is made within thirty

(30) days of submission of data or other reports to the DWR, it shall be deemed to be waived and the work, data and reports submitted shall be deemed to be approved by the LNBA PERMITTEES. Failure by the LNBA PERMITTEES or the LNBA to collect or analyze the water quality data as described in this MOA, or to provide the data to the DWR in the required format, may result in the revocation of this MOA by the DWR and the return to individual upstream and downstream monitoring requirements, as specified in the individual NPDES permits of the LNBA PERMITTEES.

The LNBA shall submit an annual written report that summarizes the previous calendar year's sampling results and formally finalizes the water quality data. The report shall be submitted no later than April 30th each year that this MOA is in effect. The annual report shall include the NPDES permit number of each actively participating permit holder and a contact name, email address and phone number for each member. Appendix C of this MOA describes the required annual report content. Two hard-copies, signed by the LNBA chairman, of these and any other reports required herein shall be submitted to the DWR Coalition Coordinator at 1621 Mail Service Center, Raleigh, NC 27699-1621.

Stream sampling may be discontinued at such times as flow conditions in the receiving waters or extreme weather conditions will result in a substantial risk of injury or death to persons collecting samples. Sampling may also be discontinued when environmental conditions, such as a dry stream, prevent sample collection. In such cases, on each day that sampling is discontinued, the DWR Coalition Coordinator shall be notified within one week (7 calendar days) of the discontinuance and written justification for the discontinuance shall be submitted with the monthly data submittal. This provision shall not be utilized to avoid the requirements of this MOA when performance of these requirements is attainable. When there is a sampling discontinuance pursuant to this provision, sampling shall be resumed at the first opportunity.

This MOA may be modified by the written consent of the DWR and the LNBA. The DWR or the LNBA may determine that it is necessary to request changes in monitoring frequency, parameters or sites to be sampled. Any such changes can only be made by a written amendment to this MOA agreed to by the DWR and the LNBA. The amendment shall be signed by the LNBA chairman and by the DWR. Such amendments may be entered into at any time.

The LNBA has historically monitored metals monthly, at six sites, as specified in the 2009 – 2014 MOA. However, routine ambient data collection for total recoverable metals has been suspended since April 3, 2007. For this reason, the LNBA has forgone metals monitoring. No requirements for metals monitoring are included in this MOA, as the DWR is currently in the process of reviewing metals water quality assessment techniques, evaluation criteria and relevant standards. However, the DWR expects to conclude its review within the life cycle of this MOA. At such time, or when the DWR Director mandates, the LNBA is expected to resume monitoring at a similar level of effort to that historically performed. Within 90 days of the release of relevant documentation, the LNBA will finalize an amendment to the MOA, which includes metals monitoring.

The following additional dischargers may enter into this MOA subsequent to the effective date hereof:

- 1) Dischargers who receive a NPDES permit within the lower Neuse River Basin, or
- 2) Dischargers who have NPDES permits within the lower Neuse River Basin but are not parties to this Agreement.

The addition of such dischargers to this MOA may be made only with the consent of the DWR and the

LNBA and shall require a written amendment to this MOA signed by the LNBA chairman, by the DWR Director and by an authorized representative of any such discharger who wishes to enter into the MOA. The DWR will not unreasonably withhold consent to the addition of a discharger to the MOA. The DWR will consider modification of the existing monitoring program described in this MOA for the addition of a discharger to the MOA. Such amendments may be made at any time that this MOA is in effect. The LNBA PERMITTEES included in this MOA are listed in Table 1.

This MOA shall be effective until July 31, 2019 unless extended by the consent of both the DWR and the LNBA. Upon sixty (60) days written notice, the DWR or the LNBA may terminate this MOA for any reason. Upon termination of this MOA, the monitoring requirements contained in the individual NPDES permit of each LNBA PERMITTEE shall become effective immediately. An individual permit holder may terminate and cancel its participation in this MOA by providing one hundred eighty (180) days written notice to the LNBA and sixty (60) days written notice to the DWR Coalition Coordinator, the appropriate DWR Regional Office and the DWR NPDES Program. The monitoring requirements contained in the individual NPDES permit shall become effective immediately upon such cancellation or termination. In the event a permit holder terminates or cancels its participation in this MOA or its membership in the LNBA is terminated for any reason, the LNBA may request that the DWR review the monitoring plan described in this MOA for a possible reduction in sampling effort or requirements.

IN WITNESS WHEREOF, the parties have caused the execution of this instrument by authority duly given, to be effective as of the date executed by the DWR.

DIVISION OF WATER RESOURCES

LOWER NEUSE BASIN ASSOCIATION

By: Signed 7/3/14
Thomas A. Reeder
Director
Division of Water Resources

By: Signed 7/1/14
Daniel F. McLawhorn
Chairman
Lower Neuse Basin Association

Date: _____

Date: _____

Table 1 - LNBA Permittees

NPDES Permit Number	Lower Neuse Basin Association Permittees Ownership and Facility	Authorized Representative and Title	County	8 Digit HUC
NC0003417	Duke Energy Progress – Lee Steam Plant	Rick Grant Plant Manager	Wayne	03020201
NC0003760	DuPont – Kinston Plant	Harold Thomas Plant Manager	Lenoir	03020202
NC0020389	Town of Benson – Benson WWTP	Matt Zapp Town Manager	Johnston	03020201
NC0021253	City of Havelock – Havelock WWTP	Frank Bottorff Interim City Manager	Craven	03020204
NC0021644	Town of La Grange – La Grange WWTP	John Craft Town Manager	Lenoir	03020202
NC0023906	City of Wilson – Wilson WWTP	Jimmy Pridgen Water Reclamation Manager	Wilson	03020203
NC0023949	City of Goldsboro – Goldsboro WWTP	Scott Stevens City Manager	Wayne	03020202
NC0024236	City of Kinston – Regional Water Reclamation Facility	Brian Lucas Water Resources Manager	Lenoir	03020202
NC0025348	City of New Bern – New Bern WWTP	Mark Stephens Interim City Manager	Craven	03020204
NC0025453	Town of Clayton – Little Creek WWTP	Steve Biggs Town Manager	Johnston	03020201
NC0029033	City of Raleigh – Neuse River WWTP	Tim Woody Wastewater & Reuse Superintendent	Wake	03020201
NC0029572	Town of Farmville – Farmville WWTP	David Hodgkins Town Manager	Pitt	03020203
NC0030716	Johnston County – Central Johnston County WWTP	Rick J. Hester County Manager	Johnston	03020201
NC0030759	City of Raleigh – Smith Creek WWTP	Tim Woody Wastewater & Reuse Superintendent	Wake	03020201
NC0032077	Contentnea Metropolitan Sewerage District – Contentnea MSD WWTP	Charles M. Smithwick, Jr. District Manager	Pitt	03020203
NC0048879	Town of Cary – North WWTP	Jamie Revels Utilities Director	Wake	03020201
NC0064050	Town of Apex – Apex WRF	Bruce Radford Town Manager	Wake	03020201
NC0064891	Town of Kenly – Kenly Regional WWTP	Greg Dunham Town Manager	Johnston	03020201
NC0065102	Town of Cary – South WWTP	Jamie Revels Utilities Director	Wake	03020201
NC0066150	Town of Fuquay-Varina – Brighton Forest Subdivision WWTP	Jay T. Meyers Public Utilities Director	Wake	03020201
NC0066516	Town of Fuquay Varina – Terrible Creek WWTP	Jay T. Meyers Public Utilities Director	Wake	03020201
NC0079316	City of Raleigh – Little Creek WWTP	Tim Woody Wastewater & Reuse Superintendent	Wake	03020203
NC0084735	Johnston County – Johnston County WTP	Rick J. Hester County Manager	Johnston	03020201

LNBA PERMITTEE SIGNATURES

NPDES Permit Number	Permittee	Signature	Date
NC0003417	Duke Energy Progress Lee Steam Plant	Signed 6/26/14 Rick Grant Plant Manager	
NC0003760	E.I. DuPont Kinston Plant	Signed 6/20/14 Harold Thomas Plant Manager	
NC0020389	Town of Benson Benson WWTP	Signed 6/17/14 Matt Zapp Town Manager	
NC0021253	City of Havelock Havelock WWTP	Signed 6/30/14 Frank Bottorff Interim City Manager	
NC0021644	Town of LaGrange LaGrange WWTP	Signed 6/26/14 John Craft Town Manager	
NC0023906	City of Wilson Wilson WWTP	Signed 6/20/14 Jimmy Pridgen Water Reclamation Manager	
NC0023949	City of Goldsboro Goldsboro WWTP	Signed 6/30/14 Scott Stevens City Manager	

LNBA PERMITTEE SIGNATURES

NPDES Permit Number	Permittee	Signature	Date
NC0024236	City of Kinston Kinston Regional WWTF	Signed 6/30/14 Brian Lucas Water Resources Manager	
NC0025348	City of New Bern New Bern WWTP	Signed 6/30/14 Mark Stephens Interim City Manager	
NC0025453	Town of Clayton Little Creek WWTP	Signed 7/1/14 Steve Biggs Town Manager	
NC0029033	City of Raleigh Neuse River WWTP	Signed 6/13/14 Tim Woody Wastewater & Reuse Superintendent	
NC0029572	Town of Farmville Farmville WWTP	Signed 6/20/14 David Hodgkins Town Manager	
NC0030716	Johnston County Central Johnston County Regional WWTP	Signed 6/19/14 Rick J. Hester County Manager	
NC0030759	City of Raleigh Smith Creek WWTP	Signed 6/13/14 Tim Woody Wastewater & Reuse Superintendent	
NC0032077	Contentnea Metropolitan Sewage District Contentnea MSD WWT	Signed 6/20/14 Charles M. Smithwick, Jr. District Manager	

LNBA PERMITTEE SIGNATURES

NPDES Permit Number	Permittee	Signature	Date
NC0048879	Town of Cary North WWTP	Signed 6/18/14 Jamie Revels Utilities Director	
NC0064050	Town of Apex Apex WRF	Signed 7/1/14 Bruce Radford Town Manager	
NC0064891	Town of Kenly Kenly Regional WWTP	Signed 6/17/14 Greg Dunham Town Manager	
NC0065102	Town of Cary South WWTP	Signed 6/18/14 Jamie Revels Utilities Director	
NC0066150	Town of Fuquay Varina Brighton Forrest Subdivision WWTP	Signed 6/12/14 Jay T. Meyers Public Utilities Director	
NC0066516	Town of Fuquay Varina Terrible Creek WWTP	Signed 6/12/14 Jay T. Meyers Public Utilities Director	
NC0079316	City of Raleigh Little Creek WWTP	Signed 6/13/14 Tim Woody Wastewater & Reuse Superintendent	
NC0084735	Johnston County Johnston County WTP	Signed 6/19/14 Rick J. Hester County Manager	

APPENDIX A
LNBA MONITORING PROGRAM

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**Table A-1
LNBA Sampling Stations, Parameters & Frequencies**

STATION NUMBER	LOCATION	Station Comments	LATITUDE (dd.ddd)	LONGITUDE (dd.ddd)	COUNTY	8 Digit HUC	STREAM CLASS	Field Measurements (Temp, DO, pH, Conductivity)	*Nutrients	**Metals	Turbidity	Suspended Residue	Fecal Coliform	Chlorophyll a
J2230000	SMITH CRK AT SR 2045 BURLINGTON MILL RD NR WAKE FOREST	DWR benthic and fish station	35.9182	-78.5348	WAKE	03020201	C NSW	M+2SM	M		M	M	M	
J2330000	NEUSE RIV AT SR 2215 BUFFALO RD NR NEUSE	dns Smith Creek WWTP	35.8479	-78.5302	WAKE	03020201	C NSW	M+2SM	M		M	M	M	
J3290000	CRABTREE CRK AT US 1 (CAPITAL BLVD) AT RALEIGH	dns North Cary WRF, USGS gage	35.8108	-78.6117	WAKE	03020201	C NSW	M+2SM	M		M	M	M	
J3970000	WALNUT CRK AT SR 2551 BARWELL RD NR RALEIGH	DWR benthic station	35.7493	-78.5345	WAKE	03020201	C NSW	M+2SM	M	M	M	M	M	
J4050000	NEUSE RIV AT SR 2555 AUBURN KNIGHTDALE RD NR RALEIGH	ups Neuse River WWTP	35.7266	-78.5139	WAKE	03020201	C NSW	M+2SM	M	M	M	M	M	
J4080000	POPLAR CRK AT SR 2049 BETHLEHEM RD NR KNIGHTDALE	last bridge before Neuse	35.7309	-78.4776	WAKE	03020201	C NSW	M+2SM	M		M	M	M	
J4130000	NEUSE RIV AT SR 1700 COVERED BRIDGE RD NR ARCHERS LODGE	dns Neuse River WWTP, ups Little Creek (Clayton) WWTP	35.6749	-78.4364	JOHNSTON	03020201	WS-V NSW	M+2SM	M	M	M	M	M	
J4170000	NEUSE RIV AT NC 42 NR CLAYTON	dns Little Creek (Clayton) WWTP, DWR benthic station, DWR AMS station, USGS gage	35.6473	-78.4056	JOHNSTON	03020201	WS-IV NSW	M+2SM	M	M	M	M	M	
J4370000	NEUSE RIV AT US 70 BUS AT SMITHFIELD	dns Johnston County WTP, DWR AMS station	35.5128	-78.3498	JOHNSTON	03020201	WS-IV NSW	M+2SM	M		M	M	M	
J4414000	SWIFT CRK AT SR 1152 HOLLY SPRINGS RD NR MACEDONIA	ups Lake Wheeler, DWR benthic station, USGS gage	35.7187	-78.7527	WAKE	03020201	WS-III NSW	M+2SM	M		M	M	M	
J4580000	SWIFT CRK AT SR 1501 (SWIFT CREEK RD) NR SMITHFIELD	Replaced J4590000 4/1/12. Extensive guardrail system created unsafe traffic pattern	35.5442	-78.3970	JOHNSTON	03020201	C NSW	M+2SM	M		M	M	M	
J4690000	MIDDLE CRK AT SR 1152 HOLLY SPRINGS RD NR HOLLY SPRINGS	ups South Cary WRF, dns Apex WWTP	35.6609	-78.8042	WAKE	03020201	C NSW	M+2SM	M		M	M	M	
J4868000	MIDDLE CRK AT SR 1375 LAKE WHEELER RD NR BANKS	dns South Cary WRF, ups Terrible Creek	35.6356	-78.7279	WAKE	03020201	C NSW	M+2SM	M	M	M	M	M	
J4980000	MIDDLE CRK AT SR 1006 OLD STAGE ROAD NR WILLOW SPRINGS	dns of Terrible Creek	35.6091	-78.6866	WAKE	03020201	C NSW	M+2SM	M		M	M	M	
J5010000	MIDDLE CRK AT NC 210 NR SMITHFIELD	ups of Neuse River	35.5075	-78.4013	JOHNSTON	03020201	C NSW	M+2SM	M		M	M	M	
J5170000	BLACK CRK AT SR 1162 BLACK CREEK RD NR FOUR OAKS	dns Holts Lake, ups Neuse River, USGS gage	35.46925	-78.45681	JOHNSTON	03020201	C NSW	M+2SM	M		M	M	M	
J5250000	NEUSE RIV AT SR 1201 RICHARDSON BRIDGE RD NR COX MILL	dns for Johnston County WWTP, ups for Progress Energy and Goldsboro WWTP, DWR benthic station	35.3741	-78.1962	JOHNSTON	03020201	WS-IV NSW	M+2SM	M	M	M	M	M	
J5390000	HANNAH CRK AT SR 1158 ALLENS CROSSROADS DR NR BENSON	ups Benson WWTP	35.3868	78.5110	JOHNSTON	03020201	C NSW	M+2SM	M		M	M	M	
J5390800	HANNAH CRK AT SR 1227 IVEY RD NR BENSON	dns Benson WWTP	35.4025	-78.4952	JOHNSTON	03020201	C NSW	M+2SM	M		M	M	M	
J5410000	MILL CRK AT SR 1200 RICHARDSON BRIDGE RD NR BENTONVILLE	USGS gage	35.3420	-78.2162	JOHNSTON	03020201	C NSW	M+2SM	M		M	M	M	
J5500000	FALLING CRK AT SR 1219 OLD GRANTHAM RD NR GRANTHAM	dns concentrated agricultural area	35.3224	-78.1282	WAYNE	03020201	WS-IV NSW	M+2SM	M		M	M	M	
J5620000	LITTLE RIV AT SR 2333 SMITHFIELD RD/GLORY RD NR ZEBULON	Possible future site of E. Wake reservoir (City of Raleigh drinking water)	35.8577	-78.3665	WAKE	03020201	WS-II HQW NSW	M+2SM	M		M	M	M	

**Table A-1
LNBA Sampling Stations, Parameters & Frequencies**

STATION NUMBER	LOCATION	Station Comments	LATITUDE (dd.ddd)	LONGITUDE (dd.ddd)	COUNTY	8 Digit HUC	STREAM CLASS	Field Measurements (Temp, DO, pH, Conductivity)	*N
J5685000	LITTLE RIV AT WEAVER RD NR BAGLEY	ups Kenly Regional WWTP	35.5791	-78.1723	JOHNSTON	03020201	WS-V NSW	M+2SM	
J5750000	LITTLE RIV AT SR 2339 BAGLEY RD NR LOWELL MILL	dns Kenly Regional WWTP	35.5613	-78.1594	JOHNSTON	03020201	WS-V NSW	M+2SM	
J5930000	LITTLE RIV AT NC 581 NR CHERRY HOPSITAL	DWQ benthic station	35.3930	-78.0258	WAYNE	03020201	C NSW	M+2SM	
J6010950	WALNUT CRK AT SR 1730 SAINT JOHNS CHURCH RD NR WALNUT CREEK	significant tributary	35.2817	-77.8686	WAYNE	03020202	C NSW	M+2SM	
J6024000	NEUSE RIV AT SR 1731 PINEY GROVE RD NR SEVEN SPRINGS	dns Goldsboro WWTP	35.2290	-77.8460	WAYNE	03020202	C NSW	M+2SM	
J6044400	BEAR CRK AT SR 1603 WASHINGTON ST NR LA GRANGE	Ups concentrated agricultural area	35.3137	-77.8153	LENOIR	03020202	C Sw NSW	M+2SM	
J6044500	BEAR CRK AT SR 1311 BEAR CREEK RD NR KINSTON	DWR benthic and fish stations	35.2489	-77.7843	LENOIR	03020202	C Sw NSW	M+2SM	
J6055000	MOSLEY CRK AT SR 1327 WILLEY MEASLEY RD NR LA GRANGE	dns LaGrange WWTP	35.3119	-77.7313	LENOIR	03020202	C Sw NSW	M+2SM	
J6150000	NEUSE RIV AT NC 11 BYPASS AT KINSTON	DWR AMS station, ups Kinston Regional WRF	35.2587	-77.5835	LENOIR	03020202	C NSW	M+2SM	
J6250000	NEUSE RIV AT NC 55 NR GRAINGERS	dns Kinston Regional WRF, ups DuPont	35.2957	-77.4962	LENOIR	03020202	C NSW	M+2SM	
J6410000	LITTLE CRK AT NC 97 AT ZEBULON	ups Little Creek (Raleigh) WWTP	35.8279	-78.3025	WAKE	03020203	C NSW	M+2SM	
J6450000	LITTLE CRK AT NC 39 AT ZEBULON	dns Little Creek (Raleigh) WWTP	35.8125	-78.2681	WAKE	03020203	C NSW	M+2SM	
J6500000	MOCCASIN CRK AT SR 1131 ANTIOCH CHURCH RD NR CONNER		35.7301	-78.1895	WILSON	03020203	C NSW	M+2SM	
J6680000	TURKEY CRK AT SR 1101 CLAUDE LEWIS RD NR MIDDLESEX	Nutrient load to Buckhorn Reservoir	35.7519	-78.1597	NASH	03020203	C NSW	M+2SM	
J6765000	CONTENTNEA CRK AT WILLOW SPRINGS DR NR DIXIE	ups Wilson WWTP, dns Wiggins Mill Reservoir	35.6838	-77.9410	WILSON	03020203	C Sw NSW	M+2SM	
J6890000	CONTENTNEA CRK AT SR 1622 EVANSDALE RD NR WILSON	dns Wilson WWTP	35.6429	-77.8902	WILSON	03020203	C Sw NSW	M+2SM	
J7210000	CONTENTNEA CRK AT NC 58 NR STANTONSBURG	DWR benthic station	35.5861	-77.8111	WILSON	03020203	C Sw NSW	M+2SM	
J7240000	TOISNOT SWAMP AT SR 1539 SAND PIT RD NR STANTONSBURG	major trib to Contentnea Creek	35.5976	-77.7947	WILSON	03020203	C Sw NSW	M+2SM	
J7325000	NAHUNTA SWAMP AT NC 58 NR CONTENTNEA	major trib to Contentnea Creek	35.5081	-77.7455	GREENE	03020203	C Sw NSW	M+2SM	
J7330000	CONTENTNEA CRK AT US 13 AT SNOW HILL		35.4585	-77.6753	GREENE	03020203	C Sw NSW	M+2SM	
J7690000	LITTLE CONTENTNEA CRK AT SR 1218 CHINQUAPIN RD NR FARMVILLE	ups Farmville WWTP	35.5881	-77.5416	PITT	03020203	C Sw NSW	M+2SM	
J7740000	LITTLE CONTENTNEA CRK AT SR 1110 HWY 903 AT SCUFFLETON	ups of Contentnea Ck	35.4567	-77.4854	PITT	03020203	C Sw NSW	M+2SM	
		dns Contentnea Creek and Contentnea MSD							

**Table A-1
LNBA Sampling Stations, Parameters & Frequencies**

STATION NUMBER	LOCATION	Station Comments	LATITUDE (dd.dddd)	LONGITUDE (dd.dddd)	COUNTY	8 Digit HUC	STREAM CLASS	Field Measurements (Temp, DO, pH, Conductivity)	*N
J4110000	MARKS CREEK AT SR 1714 (PRITCHARD RD) NR WILSON	City of Raleigh Sampling & Monitoring Program	35.7062	-78.4312	JOHNSTON	03020201	C NSW	M+2SM	
J4500000	SWIFT CREEK AT INDIAN CREEK DISCHARGE NR GARNER	City of Raleigh Sampling & Monitoring Program	35.6476	-78.6041	WAKE	03020201	C NSW	M+2SM	
J4510500	SWIFT CREEK AT SR 1525 (CORNWALLIS ROAD) NR CLAYTON	City of Raleigh Sampling & Monitoring Program	35.5999	-78.5356	JOHNSTON	03020201	C NSW	M+2SM	
J4511000	WHITE OAK CREEK AT NC 42 NR CLAYTON	City of Raleigh Sampling & Monitoring Program	35.6176	-78.5281	JOHNSTON	03020201	C NSW	M+2SM	
J4520000	SWIFT CREEK AT SR 1562 (STEEL BRIDGE RD) NR SMITHFIELD	City of Raleigh Sampling & Monitoring Program	35.5515	-78.4600	JOHNSTON	03020201	C NSW	M+2SM	
J5002000	MIDDLE CREEK OFF SR 1517 (OLD SANDERS HSE) NR EDMONSON	City of Raleigh Sampling & Monitoring Program	35.5626	-78.5756	JOHNSTON	03020201	C NSW	M+2SM	
J5790000	BUFFALO CREEK AT SR 2358 (LAKE GLAD RD) AT WENDELL	City of Raleigh Sampling & Monitoring Program	35.7697	-78.3769	WAKE	03020201	C NSW	M+2SM	

*Nutrients include Ammonia as N (NH₃), Nitrate/Nitrite as N (NO₂/NO₃), Total Kjeldahl Nitrogen (TKN), and Total Phosphorus as P (TP)

**Metals analysis will include the following metals: Aluminum (Al), Arsenic (As), Cadmium (Cd), Chromium (Cr) (total), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), Silver (Ag), Vanadium (V), and Zinc (Zn). Metals analysis will be performed at the discretion of the DWR and will be subject to change without notice. Metals analysis will be performed at the discretion of DWQ and LNBA. No metals monitoring requirements are included in this MOA, as the DWR is currently in the process of reviewing metals water quality assessment techniques. DWQ will conclude the review within the life cycle of this MOA. At such time, or when the DWR Director mandates, the LNBA is expected to resume monitoring at a level of effort similar to that in the 2009-2010 period.

*** These nutrient and chlorophyll *a* samples shall be collected as a composite sample over the photic zone (photic zone = twice the secchi depth)

M=Monthly, M+2SM=Monthly with Twice Monthly Summer Sampling during May, June, July, August, and September. Samples are to be collected at least ten days apart except when extenuating conditions exist. ups=upstream, dns=downstream

APPENDIX B

SAMPLE COLLECTION AND ANALYSIS

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Sample Collection Procedures

Sample collection shall be performed by trained personnel employed by DWR certified laboratories in accordance with the DWR Monitoring Coalition Program Field Monitoring Guidance document (December 2012) and subsequent documents. The Field Monitoring Guidance document can be found on the web at: <http://portal.ncdenr.org/web/wq/ess/eco/coalition>. Alternate collection procedures require the approval of the DWR coalition coordinator prior to use.

Laboratory Analysis

All laboratory analyses shall be performed at a DWR certified laboratory using approved methods as prescribed by section 40 of the Code of Federal Regulations part 136 (40 CFR part 136) or other methods certified by the DWR Laboratory Certification Branch (<http://portal.ncdenr.org/web/wq/lab/cert/nonfield/methods>) or the Director of DWR. 40 CFR Part 136 can be accessed on the web at <http://portal.ncdenr.org/web/wq/lab/cert/nonfield/rules>.

Reporting levels will be at least as stringent as the reporting levels used by the DWR Laboratory. For guidance purposes Table B-1 lists target reporting levels for each parameter based on the reporting levels of the DWR Laboratory. The lowest possible analytical limits for all the parameters should be pursued.

**TABLE B-1
Target Reporting Levels**

Parameters	Target Reporting Level	Comments
Temperature		Resolution to 0.1 degree Celsius.
Dissolved Oxygen		Report results to the nearest 0.1 mg/L.
pH		Report results to the nearest 0.1 SU.
Specific Conductance		Report results to the nearest whole $\mu\text{mho/cm}$ at 25 °C.
Turbidity	1.0 NTU	
TSS	2.5 mg/L	
Fecal Coliform	colonies/100 mL	At least 3 dilutions should be used to achieve optimum colony counts per membrane filter of 20-60 colonies.
Chlorophyll <i>a</i>	1 $\mu\text{g/L}$	Report Chlorophyll <i>a</i> values free from pheophytin and other chlorophyll pigments. Analysis by HPLC is not approved by DWR.
Ammonia (NH ₃ as N)	0.02 mg/L	Address distillation requirement. See 40 CFR part 136 Table II footnote.
Nitrate+Nitrite as N	0.02 mg/L	
Total Kjeldahl Nitrogen as N	0.20 mg/L	
Total Phosphorus as P	0.02 mg/L	
Al*		
As*		
Cu*		
Cd*		
Cr*		
Fe*		
Pb*		
Hg*		
Ni*		
Zn*		

*No requirements for metals monitoring are included in this MOA, as the DWR is currently in the process of reviewing metals water quality assessment techniques, evaluation criteria and relevant standards. However, the DWR expects to conclude the review within the life cycle of this MOA. At such time, or when the DWR Director mandates, the LNBA is expected to resume monitoring at a level of effort similar to that in the 2009 – 2014 MOA. Within 60 days of the release of relevant documentation, the LNBA will finalize an amendment to the MOA, which includes metals monitoring.

Data Qualification Codes

When reporting data, the DWR’s data qualifier codes must be used to provide additional information regarding data quality and interpretation. The current set of qualifier codes to be used is provided in Table B-2. Review the data remark codes at least annually and utilize the most current set, as codes are subject to change. A copy of this table can be found at <http://portal.ncdenr.org/web/wq/ess/eco/coalition>.

**Table B-2
Data Qualification Codes for Use with Coalition Data**

Data Remark Code	Code Definition
A	Value reported is the mean (average) of two or more determinations. This code is to be used if the results of two or more discrete and separate samples are averaged. These samples shall have been processed and analyzed independently (e.g. field duplicates, different dilutions of the same sample). This code is not required for BOD or coliform reporting since averaging multiple dilutions for these parameters is fundamental to those methods.
B	<p>Results based upon colony counts outside the acceptable range and should be used with caution. This code applies to microbiological tests and specifically to membrane filter (MF) colony counts. It is to be used if less than 100% sample was analyzed and the colony count is generated from a plate in which the number of colonies exceeds the ideal ranges indicated by the method. These ideal ranges are defined in the method as:</p> <p><i>Fecal coliform or Enterococcus bacteria: 20-60 colonies</i> <i>Total coliform bacteria: 20-80 colonies</i></p> <ol style="list-style-type: none"> Countable membranes with less than 20 colonies. Reported value is estimated or is a total of the counts on all filters reported per 100 mL. Counts from all filters were zero. The value reported is based on the number of colonies per 100 mL that would have been reported if there had been one colony on the filter representing the largest filtration volume (reported as a less than "<" value). Countable membranes with more than 60 or 80 colonies. The value reported is calculated using the count from the smallest volume filtered and reported as a greater than ">" value. Filters have counts of both >60 or 80 and <20. Reported value is a total of the counts from all countable filters reported per 100 mL. Too many colonies were present; too numerous to count (TNTC). TNTC is generally defined as > 150 colonies. The numeric value represents the maximum number of counts typically accepted on a filter membrane (60 for fecal and 80 for total), multiplied by 100 and then divided by the smallest filtration volume analyzed. This number is reported as a greater than value. Estimated Value. Blank contamination evident. Many non-coliform colonies or interfering non-coliform growths are present. In this competitive situation, the reported coliform value may under-represent actual coliform density. <p><i>Note:</i> A "B" value shall be accompanied by justification for its use denoted by the numbers listed above (e.g., B1, B2, etc.). <i>Note:</i> A "J2" should be used for spiking failures.</p>
BB	<p>This code applies to most probable number (MPN) microbiological tests.</p> <ol style="list-style-type: none"> No wells or tubes gave a positive reaction. Value based upon the appropriate MPN Index and reported as a less than "<" value. All wells or tubes gave positive reactions. Value based upon the MPN Index and reported as a greater than ">" value. <p><i>Note:</i> A "BB" value shall be accompanied by justification for its use denoted by the numbers listed above (e.g., BB1, BB2, etc.).</p>
C	Total residual chlorine was present in sample upon receipt in the laboratory; value is estimated. (Generally applies to cyanide, phenol, NH ₃ , TKN, coliform, and organics)

Data Remark Code	Code Definition
G	<p>A <u>single</u> quality control failure occurred during biochemical oxygen demand (BOD) analysis. The sample results should be used with caution.</p> <p>G1. The dissolved oxygen (DO) depletion of the dilution water blank exceeded 0.2 mg/L.</p> <p>G2. The bacterial seed controls did not meet the requirement of a DO depletion of at least 2.0 mg/L and/or a DO residual of at least 1.0 mg/L.</p> <p>G3. No sample dilution met the requirement of a DO depletion of at least 2.0 mg/L and/or a DO residual of at least 1.0 mg/L.</p> <p>G4. Evidence of toxicity was present. This is generally characterized by a significant increase in the BOD value as the sample concentration decreases. The reported value is calculated from the highest dilution representing the maximum loading potential and should be considered an estimated value.</p> <p>G5. The glucose/glutamic acid standard exceeded the range of 198 ± 30.5 mg/L.</p> <p>G6. The calculated seed correction exceeded the range of 0.6 to 1.0 mg/L.</p> <p>G7. Less than 1 mg/L DO remained for all dilutions set. The reported value is an estimated greater than value and is calculated for the dilution using the least amount of sample.</p> <p>G8. Oxygen usage is less than 2 mg/L for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.</p> <p>G9. The DO depletion of the dilution water blank produced a negative value.</p>
J	<p>Estimated value; value may not be accurate. This code is to be used in the following instances:</p> <p>J1. Surrogate recovery limits have been exceeded;</p> <p>J2. The reported value failed to meet the established quality control criteria for either precision or accuracy;</p> <p>J3. The sample matrix interfered with the ability to make any accurate determination;</p> <p>J4. The data are questionable because of improper laboratory or field protocols (e.g. composite sample was collected instead of grab, plastic instead of glass container)</p> <p>J5. Temperature limits exceeded (samples frozen or $>6^{\circ}$ C) during transport or not verifiable (e.g., no temperature blank provided); non-reportable for NPDES compliance monitoring.</p> <p>J6. The laboratory analysis was from an unpreserved or improperly chemically preserved sample. The data may not be accurate.</p> <p>J7. This qualifier is used to identify analyte concentration exceeding the upper calibration range of the analytical instrument/method. The reported value should be considered estimated.</p> <p>J8. Temperature limits exceeds (samples frozen or $>6^{\circ}$C) during storage. The data may not be accurate.</p> <p>J9. The reported value is determined by a one-point estimation rather than against a regression equation. The estimated concentration is less than the laboratory practical quantitation limit and greater than the laboratory method detection limit.</p> <p>J10. Unidentified peak; estimated value.</p> <p>J11. The reported value is determined by a one-point estimation rather than against a regression equation. The estimated concentration is less than the laboratory practical quantitation limit and greater than the laboratory method detection limit. <i>This code is used when an MDL has not been established for the analyte in question.</i></p> <p>J12. The calibration verification did not meet the calibration acceptance criterion for field parameters.</p> <p>Note: A "J" value shall not be used if another code applies (ex. N, V, M).</p>
M	<p>Sample and duplicate results are "out of control." The sample is non-homogenous (e.g. VOA soil). The reported value is the lower value of duplicate analyses of a sample.</p>

Data Remark Code	Code Definition
N	<p>Presumptive evidence of presence of material; estimated value. This code is to be used if:</p> <p>N1. The component has been tentatively identified based on mass spectral library search;</p> <p>N2. There is an indication that the analyte is present, but quality control requirements for confirmation were not met (i.e., presence of analyte was not confirmed by alternate procedures).</p> <p>N3. This code shall be used if the level is too low to permit accurate quantification, but the estimated concentration is less than the laboratory practical quantitation limit and greater than the laboratory method detection limit. This code is not routinely used for most analyses.</p> <p>N4. This code shall be used if the level is too low to permit accurate quantification, but the estimated concentration is less than the laboratory practical quantitation limit and greater than the instrument noise level. This code is used when an MDL has not been established for the analyte in question.</p> <p>N5. The component has been tentatively identified based on a retention time standard.</p>
P	Elevated practical quantitation limit (PQL)* due to matrix interference and/or sample dilution.
Q	<p>Holding time exceeded. These codes shall be used if the value is derived from a sample that was received, prepared and/or analyzed after the approved holding time restrictions for sample preparation and analysis. The value does not meet NPDES requirements.</p> <p>Q1. Holding time exceeded prior to receipt by lab</p> <p>Q2. Holding time exceeded following receipt by lab</p>
S	Not enough sample provided to prepare and/or analyze a method-required matrix spike (MS) and/or duplicate (MSD).
U	Indicates that the analyte was analyzed for but not detected above the reported practical quantitation limit (PQL)*. The number value reported with the "U" qualifier is equal to the laboratory's PQL*.
V	<p>Indicates the analyte was detected in both the sample and the associated method blank.</p> <p>Note: The value in the blank shall not be subtracted from the associated samples.</p>
X	<p>Sample not analyzed for this constituent. This code is to be used if:</p> <p>X1. Sample not screened for this compound</p> <p>X2. Sampled, but analysis lost or not performed-field error</p> <p>X3. Sampled, but analysis lost or not performed-lab error</p>
Y	Elevated PQL* due to insufficient sample size.
Z	<p>The presence or absence of the analyte cannot be verified. The sample analysis/results are not reported due to:</p> <p>Z1. Inability to analyze the sample.</p> <p>Z2. Questions concerning data reliability.</p>

*PQL, The Practical Quantitation Limit (PQL), is defined as the lowest level achievable among laboratories within specified limits during routine laboratory operation. The Practical Quantitation Limit (PQL) is "about three to five times the method detection limit (MDL) and represents a practical and routinely achievable detection level with a relatively good certainty that any reported value is reliable." (APHA, AWWA, WEF. 1992. Standard Methods for the Examination of Water and Wastewater, 18th ed.)

** Data remarks are current as of December 7, 2011

APPENDIX C

DATA FORMAT AND REPORTING REQUIREMENTS

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Data Format for Monthly submittals

Table C-1 provides the required data submittal spreadsheet format. Do not use commas, tabs, pipes or other common file delimiters anywhere in the table. Do not add, delete or hide rows or columns. The first row should contain the column headings only. Column headings must include appropriate information on measurement units (mg/L, µg/L, cfu/100mL, etc.). The second row must contain the method code. It is very important that the format of the headings and the number and order of columns is consistent among all monthly submissions. The DWR station number (e.g. B6140000) must be provided as identified in the MOA. The comment column is used for describing pertinent information related to the sampling event or specific samples. Ensure that there are no missing values for station, date, time, and depth. Place all remark codes in a separate column as demonstrated in Table C-1. If there is no result for a particular parameter, leave the cell blank. Screen all data for inappropriate or improbable values, such as a pH of 21.2 SU.

Annual Report

The LNBA is required to submit an annual report by April 30th for each year the MOA is in effect. The annual report will summarize all data collected in the past calendar year and contain the following elements:

- Monitoring Station List to include station number, station description, county, accurate coordinates (in decimal degrees to 4 decimal places using NAD83), stream classification and 8 digit hydrologic unit code (HUC).
- List of all certified laboratories that conducted work for the coalition in the past year and laboratory methods used for all parameters. Summarize any laboratory certification issues for individual parameters.
- A CD or DVD that includes all monitoring data for the past year with a statistical summary for each station. These data should be combined into a single table containing the year's reviewed and finalized data, which may be placed on the DWR web site. The annual statistical summary must describe for each parameter at each location:
 - Number of observations (N)
 - Number of observations less than the laboratory reporting level (N<RL)
 - Identify the water quality standard, action level, or other reference level (Ref)
 - Identify the number of observations that do not meet the reference level (N>Ref) or (N<Ref)
 - Maximum observed value and Minimum observed value
 - Annual arithmetic mean (use a geometric mean for fecal coliform data)
- Include a list of active LNBA members with authorized representative updates, contact names, email addresses and phone numbers. Identify the facility name and NPDES permit number. Provide a list of members that are no longer active in the LNBA.
- Provide a list of changes in members' names, ownerships and discharge locations.
- Summarize all quality assurance and quality control issues and any field audits conducted.
- Summarize any significant issues, special studies or projects.
- Describe any required data collection that was missed and provide an explanation.
- Review the monitoring program and suggest potential MOA modifications.
- Provide the LNBA Website Address.

**Table C-1
File Format for Coalition Data Reporting**

					Temp (°C)	Temp_rmk	DO (mg/L)	DO_rmk	pH (SU)	pH_rmk	Conductivity (µohm/cm)	Conductivity_rmk	Fecal Coliform (colonies/100ml)	Fecal Coliform_rmk	Suspended Residue (mg/L)	Suspended Residue_rmk	Enterococcus (colonies/100mL)	Enterococcus_rmk	Turbidity (NTU)	Turbidity_rmk	Chlorophyll a (µg/L)	Chlorophyll_rmk	NH3_N (mg/L)	NH3_N_rmk	TKN_N (mg/L)	TKN_N_rmk	NO2_NO3_N (mg/L)	NO2_NO3_N_rmk
Station	Date (m/d/yyyy)	Time (hh:mm)	Depth (m)	10	10_rmk	300	300_rmk	400	400_rmk	94	94_rmk	31616	31616_rmk	530	530_rmk	61211	61211_rmk	82079	82079_rmk	32209	32209_rmk	610	610_rmk	625	625_rmk	630	630_rmk	
A1234567	8/19/2002	15:30	0.1	25.2		7.8		6.9		133		110		45				22		23	Q1	0.1		0.2		0.3		
B9876543	8/20/2002	11:50	0.1	27.2		7.1		7.2		125		30		4				5.6		5		0.14		0.6		0.31		
B9876543	8/20/2002	11:50	1	28		6.5		7		122																		
B9876543	8/20/2002	11:50	2	25		6.7		6.9		119																		
B9876543	8/20/2002	11:50	3	17		5.5		6.7		120																		
C1357924	8/21/2002	16:10	0.1	22.1		3.1		6.2		233		15	B1	55				11										
C0246813	9/1/2002	9:30	0.1	19.7		8.3		7		99		6000	B5	410				36				0.26		0.4		0.57		
C0246813	10/1/2002	11:30	0.1	12		8.9		7.3		115		1200	B3	95	A				X3			0.16	J2	0.2		0.09		

**Table C-1 Cont'd
File Format for Coalition Data Reporting**

TP_P (mg/L)	TP_P_rmk	Cadmium, Cd (µg/L)	Cadmium, Cd_rmk	Chromium, Cr (µg/L)	Chromium, Cr_rmk	Copper, Cu (µg/L)	Copper, Cu_rmk	Nickel, Ni (µg/L)	Nickel, Ni_rmk	Lead, Pb (µg/L)	Lead, Pb_rmk	Zinc, Zn (µg/L)	Zinc, Zn_rmk	Aluminum, Al (µg/L)	Aluminum, Al_rmk	Iron, Fe (µg/L)	Iron, Fe_rmk	Manganese, Mn (µg/L)	Manganese, Mn_rmk	Arsenic, As (µg/L)	Arsenic, As_rmk	Mercury, Hg (µg/L)	Mercury, Hg_rmk	Comments
665	665_rmk	1027	1027_rmk	1034	1034_rmk	1042	1042_rmk	1067	1067_rmk	1051	1051_rmk	1092	1092_rmk	1105	1105_rmk	1045	1045_rmk	1055	1055_rmk	1002	1002_rmk	71900	71900_rmk	
		130				11	3			27				10				0.21		12		12		
		120		10	U	2	U	25	U	2	U	510		10	U	10	U	0.2	U	10	U	10	U	
																								Secchi depth 1.2 meters
		333		10	U	2	U	25	U	2	U	624		10	U	10	U	0.2	U	10	U	10	U	Nutrient Sample Spilled
		120		10	U	2	U	25	U	2	U	510		10	U	10	U	0.2	U	10	U	10	U	2.5" of rain on 8/31/2002
		120		10	U	2	U	25	U	2	U	510		10	U	10	U	0.2	U	10	U	10	U	